

319.00 EUR

incl. 19% VAT, plus [shipping](#)



**Support:** [Driver \(Windows\)](#) | [AT Commands Manual](#) | [Specifications](#)

Quectel RM500Q-AE is a 5G module optimized specially for IoT/eMBB applications. Adopting the 3GPP Rel. 15 LTE technology, it supports both 5G NSA and SA modes. Designed in an M.2 form factor, RM500Q-AE is compatible with Quectel LTE-A Cat 6 module EM06, Cat 12 module EM12 and Cat 16 module EM160R-GL, which will facilitate customers to migrate from LTE-A to 5G.

The global version RM500Q-AE nearly covers all the mainstream carriers worldwide. The module supports Qualcomm® IZat™ location technology Gen8C Lite (GPS, GLONASS, BeiDou/Compass and Galileo). The integrated GNSS receiver greatly simplifies product design and provides quicker, more accurate and more dependable positioning capability.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities (USB/PCIe drivers for Windows 7/8/8.1/10, Linux, Android) extend the applicability of the module to a wide range of M2M and IoT applications such as industrial router, home gateway, STB, industrial laptop, consumer laptop, industrial PDA, rugged tablet PC, video surveillance and digital signage.

## Features

- 5G/4G/3G Multi-mode module with M.2 form factor, optimized for IoT and eMBB applications
- Worldwide 5G and LTE-A coverage
- Both NSA and SA modes
- Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- Feature refinements: DFOTA and VoLTE (optional)

## Frequency Bands

5G NR :

n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79

LTE-FDD :

B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29

LTE-TDD : B34/B38/39/B40/B41/B42/B43/B48

**LTE LAA : B46** (only support 2x2 MIMO)

WCDMA : B1/B2/B3/B4/B5/B6/B8/B19

GNSS : GPS/GLONASS/BeiDou (Compass)/Galileo

Supply voltage range: 3.3–4.4 V

Typical supply voltage: 3.7 V

## Power Supply

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Transmitting Power         | <p>Class 3 (24 dBm +1/-3 dB) for WCDMA bands</p> <p>Class 3 (23 dBm ±2 dB) for LTE bands</p> <p>Class 3 (23 dBm ±2 dB) for 5G NR bands</p> <p>Class 2 (26 dBm ±2 dB) for LTE B38/B40/B41/B42 bands HPUE</p> <p>Class 2 (26 dBm +2/-3 dB) for 5G NR n41/n77/n78/n79 bands HPUE</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data Transmission          | <p>5G SA Sub-6 Data Rate (Mbps) : DL 2.1 Gbps; UL 900 Mbps</p> <p>5G NSA Sub-6 Data Rate (Mbps) : DL 2.5 Gbps; UL 650 Mbps</p> <p>LTE Data Rate (Mbps) : DL 1.0 Gbps; UL 200 Mbps</p> <p>WCDMA Data Rate (Mbps) : DL 42 Mbps; UL 5.76 Mbps</p> <p>Supports 3GPP Rel-15</p> <p>Supported modulations:</p> <p>Uplink: <math>\pi/2</math>-BPSK, QPSK, 16QAM, 64QAM and 256QAM</p> <p>Downlink: QPSK, 16-QAM, 64-QAM and 256-QAM</p> <p>Supported MIMO:</p> <p>Uplink: 2 × 2 MIMO* on n41/n77/n78/n79</p> <p>Downlink: 4 × 4 MIMO on n1/n2/n3/n7/n25/n38/n40/n41/n48/n66/n77/n78/n79</p>                                                                                                                                                                                                                                        |
| 5G NR Features             | <p>Supports SCS 15 kHz and 30 kHz</p> <p>Supports SA and NSA operation modes</p> <p>Supports Option 3x, 3a and Option 2</p> <p>RG500Q-EA:</p> <p>NSA: Max. 2.5 Gbps (DL)/650 Mbps (UL)</p> <p>SA: Max. 2.1 Gbps (DL)/900 Mbps (UL)</p> <p>RG500Q-NA*:</p> <p>NSA: Max. 2.5 Gbps (DL)/650 Mbps (UL)</p> <p>SA: Max. 2.1 Gbps (DL)/450 Mbps (UL)</p> <p>RG502Q-EA:</p> <p>NSA: Max. 5.0 Gbps (DL)/650 Mbps (UL)</p> <p>SA: Max. 4.2 Gbps (DL)/900 Mbps (UL)</p> <p>Supports 3GPP Rel-15</p> <p>Supports up to CA Cat 16 FDD and TDD</p> <p>Supported modulations:</p> <p>Uplink: QPSK, 16-QAM, 64-QAM and 256-QAM</p> <p>Downlink: QPSK, 16-QAM, 64-QAM and 256-QAM</p> <p>Supports 1.4/3/5/10/15/20 MHz RF bandwidth</p> <p>Supports DL 4 × 4 MIMO on B1/B2/B3/B4/B7/B25/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46/B48/B66</p> |
| LTE Features               | <p>RG500Q-EA:</p> <p>LTE: Max. 1.0 Gbps (DL)/200 Mbps (UL)</p> <p>RG500Q-NA*:</p> <p>LTE: Max. 1.0 Gbps (DL)/200 Mbps (UL)</p> <p>RG502Q-EA:</p> <p>LTE: Max. 2.0 Gbps (DL)/200 Mbps (UL)</p> <p>Supports 3GPP Rel-9 DC-HSDPA, HSPA+, HSDPA, HSUPA and WCDMA</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| UMTS Features              | <p>Supports QPSK, 16-QAM and 64-QAM modulations</p> <p>DC-HSDPA: Max. 42 Mbps</p> <p>HSUPA: Max. 5.76 Mbps</p> <p>WCDMA: Max. 384 kbps (DL)/384 kbps (UL)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Internet Protocol Features | <p>Supports</p> <p>QMI/TCP*/UDP*/FTP*/HTTP*/NTP*/PING*/HTTPS*/SMTP*/MMS*/FTPS*/SMTPS*/SSL* protocols</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| SMS               | <p>Text and PDU modes</p> <p>Point-to-point MO and MT</p> <p>SMS cell broadcast</p> <p>SMS storage: ME by default</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| (U)SIM Interfaces | <p>Supports SIM/USIM cards: 1.8/2.95 V</p> <p>Supports two digital audio interfaces: PCM* and I2S 2)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Audio Features    | <p>WCDMA: AMR/AMR-WB</p> <p>LTE: AMR/AMR-WB</p> <p>Supports echo cancellation and noise suppression</p> <p>Supports 16-bit linear data format</p> <p>Supports long frame synchronization and short frame synchronization</p>                                                                                                                                                                                                                                                                                                                                                                                                 |
| PCM Interface     | <p>Supports master and slave modes, but must be in master mode for long frame synchronization</p> <p>Supports 16-bit linear data format</p> <p>I2S is commonly used as a 4-wire DAI (normally I2S_MCLK is not used in the design) in Hi-Fi, STB and portable devices. The Tx and Rx lines are</p>                                                                                                                                                                                                                                                                                                                            |
| I2S Interface     | <p>used for audio transmission, while the bit clock and left/right clock synchronize the link. I2S is flexible in that either the controller or codec can drive (master) the bit clock and left/right clock lines.</p> <p>Can be multiplexed to PCM function</p> <p>Compliant with USB 3.1 and 2.0 specifications, with maximum transmission rates of up to 10 Gbps on USB 3.1 and 480 Mbps on USB 2.0</p> <p>Used for AT command communication, data transmission, GNSS NMEA output, software debugging and firmware upgrade</p> <p>Supports USB serial drivers for: Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x–9.x</p> |
| USB Interface     | <p>USB Serial Driver : Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x/5.x/6.x/7.x/8.x/9.x/10</p> <p>GNSS Driver : Android 4.x/5.x/6.x/7.x/8.x/9.x/10</p> <p>RIL Driver : Android 4.x/5.x/6.x/7.x/8.x/9.x/10</p> <p>NDIS Driver : Windows 7/8/8.1/10</p> <p>MBIM Driver : Windows 7/8/8.1/10, Linux 3.18–5.4</p> <p>GobiNet Driver : Linux 2.6–5.4</p> <p>QMI_WWAN Driver : Linux 3.4–5.4</p>                                                                                                                                                                                                                                 |
| UART Interfaces   | <p>Main UART:</p> <p>Used for AT command communication</p> <p>Baud rate: 115200 bps by default</p> <p>Supports RTS and CTS hardware flow control</p> <p>Debug UART:</p> <p>Used for Linux console and log output</p> <p>Baud rate: 115200 bps</p> <p>BT UART:</p> <p>Used for BT communication</p> <p>Baud rate: 115200 bps</p> <p>COEX UART:</p> <p>Used for WWAN/WLAN coexistence algorithms</p>                                                                                                                                                                                                                           |

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| PCIe Interface                  | Compliant with PCI Express Specification Revision 3.0<br>Supports 2 lanes, 8 Gbps/lane<br>Can be used to connect an external WLAN IC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Rx-diversity                    | Supports 5G NR/LTE/WCDMA Rx-diversity<br>Gen9C Lite of Qualcomm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| GNSS Features                   | Supports dual-band GNSS: L1 and L5<br>Protocol: NMEA 0183<br>Data update rate: 1 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Antenna Tuner Control Interface | GRFC interface dedicated for external antenna tuner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| AT Commands                     | Compliant with 3GPP TS 27.007, 27.005 and Quectel enhanced AT commands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Network Indication              | Two pins NET_MODE* and NET_STATUS to indicate network connectivity status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Antenna Interfaces              | Eight cellular antenna interfaces (ANT0–ANT7) and one GNSS antenna interface (ANT_GNSS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Physical Characteristics        | 52.0mm x 30.0mm x 2.3mm, 8.4g<br>Standard operating temperature range : -20 to 60°C<br><br>Operating temperature range: -30 °C to +75 °C<br>To meet this operating temperature range, you need to ensure effective thermal dissipation, for example, by adding passive or active heatsinks, heat pipes, vapor chambers, etc. Within this range, the module can meet 3GPP specifications.                                                                                                                                                                                                                                                                                                                          |
| Operating Temperature           | Extended temperature range: -40 °C to +85 °C<br>To meet this extended temperature range, you need to ensure effective thermal dissipation, for example, by adding passive or active heatsinks, heat pipes, vapor chambers, etc. Within this range, the module remains the ability to establish and maintain functions such as voice, SMS, emergency call, etc., without any unrecoverable malfunction. Radio spectrum and radio network are not influenced, while one or more specifications, such as Pout, may undergo a reduction in value, exceeding the specified tolerances of 3GPP. When the temperature returns to the normal operating temperature level, the module will meet 3GPP specifications again. |
| Firmware Upgrade                | Storage temperature range: -40 °C to +90 °C<br>USB 2.0 and DFOTA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |